



ENERGY EFFICIENCY PROJECT DEVELOPMENT VAS/DEPP3 Programme

INSTALLATION OF A HIGH-EFFICIENCY BIOMASS-FIRED BOILER TO IMPROVE ENERGY EFFICIENCY IN A PAPER PLANT

Sector: Paper

Energy focus: Steam system

At this paper manufacturing facility, the steam system accounted for 50% of total energy consumption and suffered from a highly inefficient, decentralized configuration. The plant operated a mix of seven small coal- and biomass-fired boilers with low thermal efficiencies ranging from 61.3% to 68.3%. This fragmented setup caused unstable steam pressure, required high labor costs, and lacked the capacity to support the factory's planned production expansion from 32 t/h to 40 t/h of steam.

Guided by the feasibility study, the enterprise invested in consolidating its thermal network by **installing a new, centralized 25-ton/hour biomass boiler utilizing advanced step-grate technology.**

This investment has helped the plant:

- Centralize steam generation to significantly **improve average operating efficiency**;
- Completely **eliminate coal consumption** and its associated greenhouse gas emissions;
- Save **78,608 GJ of fuel energy annually**;
- Provide the **stable, expanded steam capacity** required for the plant's new tissue paper production line.

FINANCIAL PERFORMANCE SUMMARY



**NET PRESENT
VALUE (NPV)***

**~26
BILLION VND**



**SIMPLE PAYBACK
PERIOD**

**~3.1
YEARS**



**INTERNAL RATE
OF RETURN
(IRR)***

~31.37%

(*) = baseline scenario

ENERGY BENEFITS



**TOTAL ENERGY
SAVINGS**

**78,608
GJ/YEAR**



**ANNUAL CO₂
REDUCTIONS**

**~3,038
tCO₂e/YEAR**

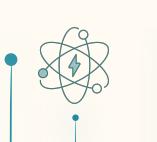


**COAL
REDUCTION**

**100%
(from ~2.370
tons/year)**

NON-ENERGY BENEFITS

- **Expanded Production Capacity:** Delivers stable, high-volume steam to support the new tissue paper line.
- **Slashed Maintenance Costs:** Replaces seven aging boilers with one centralized system, drastically reducing labor.
- **Cleaner, Coal-Free Operations:** Eliminates coal consumption entirely, improving air quality and reducing solid waste.
- **Enhanced Competitiveness:** Reduces the enterprise's carbon footprint and leverages its green brand image.



WHY THIS CASE MATTERS?

Steam generation typically accounts for the largest share of total energy consumption in paper mills in Vietnam. As manufacturers look to scale up production, many face the dual challenge of expanding capacity while simultaneously meeting stricter national and international mandates for decarbonization.

This project proves that production expansion and the green transition can go hand-in-hand. To meet the increasing demand, investing in a centralized, high-efficiency biomass boiler brings significant energy savings compared to operating multiple inefficient, decentralized units. By adopting modern step-grate technology and utilizing locally sourced biomass, paper mills can completely phase out coal, stabilize their thermal networks, and achieve low-carbon manufacturing without compromising future growth.

EXPLORE SIMILAR OPPORTUNITIES

For more information and additional case studies, please visit:



**Vietnam – Denmark
Energy Partnership Programme
2020-2025**



**Energy Efficiency
Center of Excellence**



This case was developed under the Voluntary Agreement Scheme (VAS) for the Vietnamese Industrial Sector, part of the DEPP3 Programme (Vietnam – Denmark Energy Partnership Programme Phase III).

VAS supports industrial enterprises in identifying, preparing, and implementing bankable energy efficiency investments through structured audit, pre-feasibility and feasibility assessment processes.